MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

DRAFT ENVIRONMENTAL ANALYSIS FOR WEED MANAGEMENT

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Region 5
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1.0 PURPOSE AND NEED

The purpose of this environmental analysis (EA) is to assess management options for weeds on lands administered by the Montana Department of Fish, Wildlife, and Parks (FWP) in south-central Montana. Region 5 of FWP includes 38 fishing access sites, 7 state parks in Big Horn, Carbon, Stillwater, Sweet Grass, Wheatland, and Yellowstone counties, 3 Wildlife Management Areas, 2 State Fish Hatcheries, and an FWP Regional Headquarters. They are important resources for residents and visitors providing recreational access to many Montana rivers and lakes. It is essential to maintain the natural vitality of these areas and encourage management which contributes to the quality of life for present and future generations of Montanans.

Noxious weeds have invaded many FWP sites in Region 5 replacing native plants. Montana has recognized the damaging effects of weeds and has enacted laws and regulations to reduce the propagation of noxious weeds. All counties within Region 5 have adopted weed control programs to help eliminate or reduce noxious weed populations. FWP has adopted a statewide weed management policy that:

> *"seeks to prevent, to the extent feasible, the reproduction and distribution of agriculturally undesirable plant species throughout department land or from department lands onto adjacent lands."*

FWP proposes to implement a weed management plan in Region 5, in compliance with county weed control plans that will inventory specific site conditions, designate weed management zones, prescribe management options for each site and rank sites by treatment priority.

State parks and state fishing access sites are widely distributed in Region 5. Site conditions, such as rainfall, soils, surface water, groundwater and topography vary considerably. Because of the numerous sites, it is impractical to conduct a detailed review for each site as a precursor to weed management planning. Enough information is currently available for these sites to begin the weed management process. Many of the sites share similar characteristics and are part of a bioregion with common physical, natural, and cultural traits. These common characteristics and traits will be used to evaluate sites and make recommendations for weed treatment.

2.0. ALTERNATIVES

Four alternative weed management programs were selected for analysis (Figure 1). Differences between alternatives include the types of treatment, treatment levels, responsiveness to legal and regulatory requirements, and the potential impacts on weed populations, environmental quality and human health.

2.1 Alternative 1: No Action

No coordinated, widespread weed management would be initiated under this alternative. Weed control methods such as mowing and chemical applications would be maintained at present levels and no additional effort will go toward weed management. This alternative will emphasize prevention in weed-free areas by restricting access and control of weed infested areas through limited mowing and chemical use. The licensed pesticide applicator currently under contract with FWP would continue limited herbicide applications.

2.2 Alternative 2: Chemical Control

Alternative 2 emphasizes the reduction and eradication of noxious weeds by the exclusive use of chemical herbicides. Herbicides would be the chosen method of control except where label directions preclude herbicide use or where there are other special concerns. This alternative is designed to provide the greatest control across the largest area at the lowest cost. Weed control is the main emphasis of this method and other resource goals are considered secondary.

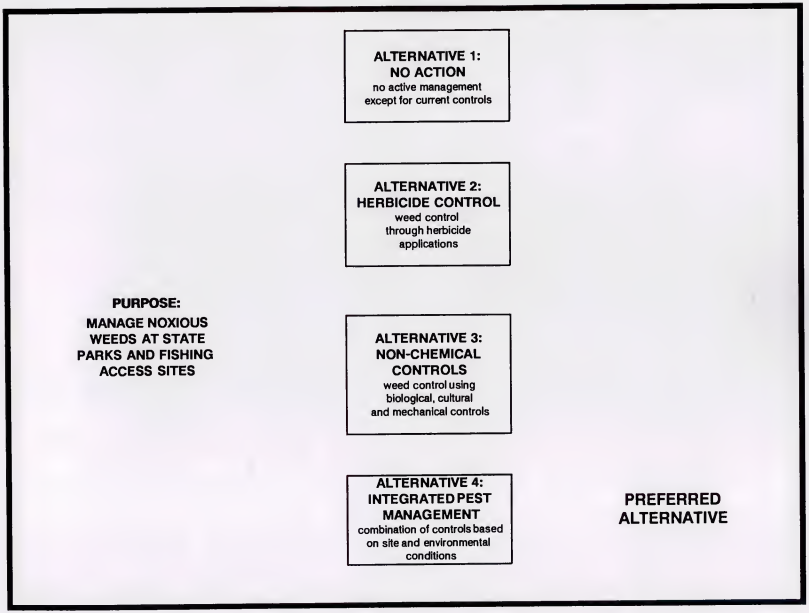
2.3 Alternative 3: Cultural, Mechanical, and Biological Control (Non-Chemical)

Alternative 3 relies on methods other than chemical herbicides such as cultural, mechanical and biological controls to manage weed populations. Emphasis would be placed on containing existing weed infestations and preventing further infestation with cultural controls. Mechanical control methods would be used to reduce current weed populations within the constraints of FWP budgetary resources and likely volunteer support. Biological control methods will be supported as effective pathogens become available to provide for long-term control of weeds.

2.4 Alternative 4: Integrated Pest Management

Alternative 4 is an Integrated Pest Management (IPM) approach which emphasizes the integration of cultural, mechanical, biological and chemical control methods. The specific control method used at a specific site will vary with the type and amount of noxious weeds present, site conditions, political concerns and other factors. All of these factors may change with time and require a readjustment of control methods. An important part of IMP is its flexibility and the ability to adapt to change.

FIGURE 1. WEED MANAGEMENT ALTERNATIVES



2.5 Proposed Action

FWP is proposing to select Alternative 4 (IPM) as the preferred alternative for managing weeds on lands administered by the agency in Region 5. This integrated pest management approach adopts species-specific control strategies that aim to either prevent, eradicate, reduce, control, or tolerate weed species. Under the proposed IMP plan, FWP would inventory specific site conditions, designate weed management zones, prescribe management options for each site and rank sites by treatment priority. Alternative 4 is described further in the Montana Department of Fish, Wildlife and Parks Draft Weed Management Plan (Land and Water 1991).

2.6 Comparison of Alternatives

The alternatives under consideration use a range of approaches for addressing weed management concerns in Region 5. Each alternative is evaluated in relation to a variety of important natural resources (Table 1). Other concerns are also addressed including cost, human health, effectiveness, and legal concerns.

Alternative 1 would continue the present mixture of mechanical and occasional chemical controls without a formal management plan, site specific inventories or notification and spill response plans. Under this alternative, weeds would continue to increase across most FWP lands and would not be controlled or eradicated at any sites. Soils would be impacted by increased erosion potential and weed seed buildup. Water quality would be susceptible to contamination from spills and improper application. Native vegetation would continue to be replaced by weeds. Wildlife would be impacted from weeds replacing native plants. Fish would not be affected except from potential spills or improper application.

Human health concerns include exposure to chemical herbicides and weed pollen. Legal concerns include administrative and civil liability for uncontrolled weeds and for unwanted chemical effects. Costs are moderate and would not change from current levels.

Alternative 2 would use chemical herbicides exclusively for weed control. This alternative has the potential for short term impacts on air and soil quality and the greatest potential for impacts to water quality. Chemical spills are the main source of potential negative impacts. This spill potential also is the greatest likely impact for wildlife and fisheries. Native vegetation would be improved by eliminating weed competition although there is the potential for adverse impacts to sensitive plant species.

This alternative presents the greatest potential human health impacts from chemical exposure although health risks from weed pollen will decrease. Legal concerns mainly relate to chemical exposure. This alternative should provide effective weed control in treated areas but chemicals cannot be used on significant areas of FWP lands due to surface or groundwater conditions. This alternative will therefore leave some sites untreated. Costs for this alternative are low to moderate.

Alternative 3 would use control methods other than chemical herbicides. In this case, weeds would likely continue to increase since budget and manpower limitations would not allow extensive treatments covering most FWP lands. Minor impacts would be expected for air, soil and water resources, mainly related to soil erosion, dust and sedimentation. Native vegetation would continue to be replaced by weeds. Wildlife habitat and forage values would be reduced as weeds continue to survive and invade. Fisheries would not be significantly affected. Human health risks from chemical exposure are not a factor in this alternative but risks from equipment use and manual labor are greatest with these methods. Legal liabilities should be low unless weed control is not effective. Weed control may not be effective if an adequate effort cannot be made due to manpower and budget limitations. The most prohibitive factor in this alternative is the cost of effective mechanical weed control.

Alternative 4 uses a flexible combination of weed control techniques specifically adapted to weed and site conditions at individual locations. This Integrated Pest Management (IPM) will include substantial chemical control in the initial phase but the long-term goal would be to replace most chemical control with other methods. Air, soil, water and fisheries resources may have short-term, minor impacts if accidental spills or misapplications occur. Native vegetation would be improved by eliminating weed competition although there is the potential for adverse impacts to sensitive plant species. Wildlife should benefit from an increase in native plant species but may have short-term, minor impacts if accidental spills or misapplications occur.

Increased health risk under this alternative includes exposure to chemicals and equipment as well as injury from manual labor. Weed control under this IPM approach should be very effective. Legal concerns mainly relate to potential chemical exposure. Costs for the IPM program should be moderate and can be made flexible depending on budgets, manpower and other factors.

TABLE 1. COMPARISON OF WEED MANAGEMENT ALTERNATIVES
(comparisons are made in relation to current conditions)

	Alternative 1 No Action	Alternative 2 Chemical Control	Alternative 3 No Chemical Use	Alternative 4 Integrated Pest Management
Air Quality	Short-term, local, minor effects due to chemical vapor, noise, or odors.	Short-term, local, minor effects due to chemical vapor, noise, or odors; potential greater then under other Alternatives.	Minor, temporary, local dust potential from soil exposed in mechanical control. Weed pollen may affect some individuals.	Short-term, local, minor effects due to chemical vapor, noise, odors or dust.
Soils	Potential to reduce total plant cover leading to increased erosion and long-term fertility decrease. Weed seed buildup in soil.	Possible soil contamination due to misapplication or spills.	Minor, temporary erosion increase from mechanical control methods. Buildup of weed seeds without adequate control.	Possible soil contamination due to misapplication or spills.
Water Quality	Possible water quality impacts due to misapplication or spills.	Greatest potential for chemical contamination due to misapplication or spills.	No potential for chemical contamination. Slight potential for sedimentation if mechanical treatments result in erosion.	Possible water quality impacts due to misapplication or spills.
Vegetation	Decline of desirable plant communities due to weed invasion and competition.	Greatest potential for adverse impacts to non-target vegetation. Potential for increases in native plants.	Reduction of native species distribution and diversity as weeds invade. Small potential for impacts on non-target vegetation from mechanical control methods.	Lowest potential for impacts to native/domestic plant damage through mitigation.
Wildlife	Reduced wildlife habitat quality due to noxious weed invasion.	Greatest potential for chemical ingestion and exposure to wildlife species.	Reduced wildlife habitat quality due to noxious weed increase.	Reduced potential for negative impacts with mitigation measures and management guidelines.
Fisheries	Potential for local short term impacts from chemical spills or misapplication.	Greatest potential for short term, local impacts from chemical spills.	Little potential impact.	Potential for local short term impacts from chemical spills or misapplication.
Human Health	Increased potential for allergies, respiratory or skin ailments from weeds. Possible risks of exposure to chemicals.	Increased possibility of exposure to chemicals.	Reduced risk from chemical exposure. Increased accident risk from equipment use and manual labor. Increased risk of allergies from dust, pollen and weed contact.	Possibility of exposure to chemicals or personal injury from equipment.

Effectiveness	Not effective at eradicating, reducing or controlling weeds.	Effective in areas which can be treated. No control in untreated areas.	Moderately effective at controlling weeds in most areas if conducted properly.	Effective at controlling most weeds over long periods.
Legal Concerns	Weeds not legally controlled. Policies and procedures not clear. Subject to civil or administrative actions.	Potential liability from chemical misuse, accident or other exposure.	Potential administrative or civil liability if weeds are not adequately controlled.	Potential liability from chemical misuse, accident or other exposure.
Cost	Moderate. Should be reduced over time. ($5/acre mowing, $25- 50/acre herbicide).	Low for control in areas where chemical is used ($25-50/acre).	Cultural controls are low cost (planning, education). Mechanical methods can be very high (hand pulling $200-500/acre).	Moderate costs which can be flexible depending on budget and other factors.

2.7 Weed Control Methods

Weed control methods proposed for FWP Region 5 include cultural, mechanical, biological and chemical techniques. The magnitude of the initial control attempt would require tremendous manpower and expense using cultural and mechanical methods. It is therefore expected that chemical control will be an important component of the IPM strategy in initial weed control efforts.

2.71 CULTURAL AND MECHANICAL WEED CONTROL

Cultural and mechanical weed control will continue to be a part of the Region 5 program. On some sites, and especially where manpower is available, these methods may provide adequate weed control. Cultural and mechanical methods to be used in FWP Region 5 include:

- Prevention
- Revegetation
- Digging/ Hand-pulling
- Mowing/weed whipping
- Traffic Control
- User education

Since it is unlikely that FWP budgets will allow sufficient manpower to provide weed control in all areas restricted from chemical use especially "Water Quality Protection Management Zone", volunteer groups will be encouraged to assist FWP. Sportsmen, students, church groups, scouts and others will be solicited for these projects.

2.72 BIOLOGICAL WEED CONTROL

FWP Region 5 will encourage continued developments of biological weed control agents in Montana. Region 5 will participate in releases of biological agents whenever possible and will cooperate with research projects by other organizations.

2.73 CHEMICAL WEED CONTROL

The herbicides picloram (Tordon), clopyralid (Stinger), glyphosate (Roundup) and imazapyr (Arsenal) will be used on FWP property in Region 5. These herbicides are some of the least toxic, persistent and mobile available. They may be used alone or in approved combinations. Appendix D of the draft weed management plan (Land and Water 1993) contains chemical labels and material safety data sheets (MSDS) for each of these herbicides . Other herbicides, approved for use by the EPA and licensed for use in Montana, may be considered in the future. New chemicals proposed for use will be reviewed by FWP resource staff before approval.

Herbicides will be applied according to label directions, management zone goals, concerns for threatened, endangered and sensitive (TES) species and other site-specific constraints required by this plan. Restricted-use chemical applications will be supervised by an applicator licensed in the State of Montana. This licensed applicator will be an FWP employee if applications are made by FWP. Contracted applications will also be supervised by a licensed contract applicator.

Site-specific plans will be developed for all proposed herbicide treatments as part of the treatment zone prescriptions. Herbicide use will depend on the treatment objective, season, weed species, weed growth stage, topography, expected cost, equipment limitations, and potential environmental impacts. Herbicide application rates will depend on weed species, weed density, non-target vegetation (especially TES species), soil type, management zone, wildlife, and presence of surface waters, wetlands, shallow groundwater or groundwater recharge zones.

Vehicle-mounted sprayers (hand guns, booms) will be used primarily along roadways and in off-road areas which are readily accessible by vehicle. Vehicle use will be restricted where soil or vegetation may be significantly disturbed. Examples of restrictive conditions include moist, compactable soil and/or steep slopes. Boom applicators will only be used where weeds are sufficiently concentrated. Hand gun application will be used for spot treatment of weeds in vehicle accessible areas. Under both hand gun and boom methods, chemicals will be applied in a manner that gives the best coverage with the least amount of drift.

Hand applications will be made with backpack sprayers and wiper applicators. Backpack sprayers will be used on small or scattered patches in rough terrain or environmentally sensitive areas. Contact systemic herbicides, such as glyphosate, will be used to treat individual plants or for seedbed preparation.

Precautions for use will include at a minimum:

- Herbicide applications will not be conducted when wind velocities exceed 10 mph.
- During application periods, weather conditions, especially wind speed and temperature will be measured hourly by applicators.
- Calibration checks will be conducted at the beginning of the spraying season and periodically throughout to ensure that equipment is functioning correctly.
- Label requirements will be followed for all herbicide applications. Further precautions may be determined to be necessary during the pre-treatment reviews.
- All contract chemical applications will be made by a licensed applicator.
- Temporary signing will be posted in areas of treatment to warn the public.

The herbicide program will be evaluated annually as part of the overall weed monitoring and evaluation program.

2.74 INTEGRATED PEST MANAGEMENT

Integrated pest management (IPM) is a flexible combination of cultural, mechanical, biological and chemical control methods. Many IPM programs start with an emphasis on chemical controls to bring weed populations to a level where other methods can be effective. The long-term goal is to meet weed management goals while decreasing chemical use over time.

The success of IPM depends on the ability to monitor pest problems and to keep accurate records of pest outbreaks and the conditions that promote them, the treatments that are effective and the costs or tradeoffs that must be considered.

3.0 AFFECTED ENVIRONMENT

3.1 Setting

FWP Region 5 includes all of Yellowstone, Big Horn, Carbon, Sweet Grass, and Stillwater Counties, and a portion of Wheatland County. Topography in this section of south-central Montana is dominated by north-south tending mountain ranges with valleys at 2,700 to 5,000 feet and surrounding mountains rising 6,000 to 12,610 feet at Silver Run Peak in the Beartooth Mountains. Valleys are drained by a system of major rivers and small streams. Rivers include the main Yellowstone River Drainage; the Musselshell River Drainage; the Clarks Fork of the Yellowstone; the Big Horn River; and the entire Stillwater, Boulder, and Rock Creek Tributaries. Most of the urban, residential and agricultural development is located in these major river valleys. Billings is the largest population center in the area (nearly 86,000 in the valley area).

Most state parks and fishing access sites are located in the valley bottoms adjacent to rivers or lakes. Region 5 contains 7 state parks, 38 fishing access sites and the FWP regional headquarters. This discussion of affected environment focuses on conditions at these valley bottom sites.

3.2 Air Quality

Air quality throughout Region 5 is generally good and most areas meet state and federal air quality standards. Billings is the only area not in attainment for fine particulate carbon monoxide and sulfur dioxide. This is primarily due to temperature inversions trapping urban air pollution from automobile exhausts and industrial emissions. Other areas in south-central Montana have intermittent minor conditions that may cause temporary pollution problems but are not persistent and do not exceed federal and state standards.

3.3 Geology and Soils

Geology within Region 5 is extremely complex with a wide variety of rock types and geologic processes. The Absaroka-Beartooth Mountains dominate the southwest portion of Region 5. The range is composed mostly of precambrian metamorphic rocks uplifted several thousand feet along faults. Overlying sedimentary rocks have been folded and in several cases, tilted to a nearly vertical position, as seen in the limestone palisades south of Red Lodge.

The surrounding plains are composed of flat-lying or tilted sedimentary rocks deposited during the cretaceous period paleocene epoch. The rocks are mostly shales and sandstones with many limestone, coal and Bentonite beds. Folds and fault systems associated with mountain uplifts affect the bedding and outcrop pattern of these rocks. Alluvium represents the most recent strata. It consists of fine to coarse grained sediments deposited by moving water and is found in active or abandoned stream channels, or as outwash benches on the foothills of mountains.

Soils at FWP sites in Region 5 have properties that are mostly dominated by their geologic origins. Most soils at these sites have a surface layer of loan, clay loam, fine and sandy loam, or silty clay loam.

Forest, grassland and wetland soils are all common on FWP lands. Soil textural families are mainly sandy-skeletal and loamy skeletal. Common soil classifications include:

- Fluvents
- Aquents
- Psamments
- Loamy-skeletal, mixed, Lithic Haplobarolls and Lithic Cryobarolls
- Sandy-skeletal, mixed, flunentic Haplobarolls
- Clayey-skeletal, mixed, Lithic Argibarolls

3.4 Water Quality

Most FWP sites in Region 5 are located near rivers or lakes and have both surface and groundwater quality concerns. Surface water from rivers and lakes is used for irrigation and sometimes as drinking water supplies. Water quality is important for these uses and many others including fisheries and wildlife habitat. Groundwater is used as a source for drinking, irrigation and stockwater throughout much of Region 5 and is also an important source of recharge for many surface water supplies. Since groundwater is used for drinking supplies and surface recharge, its quality is essential to protecting human health.

3.41 SURFACE WATER

FWP Region 5 includes most of the mid-Yellowstone River Drainage from the mouth of the Big Horn River near Custer to Springdale, and the Musselshell River Drainage from Melstone to Martinsdale. Major tributaries are the Stillwater, Boulder, Rock Creek, Clarks Fork and Big Horn Rivers. Principal standing water bodies include Cooney Reservoir, Deadman's Basin Reservoir and Big Horn Lake.

Land use over the past century has affected surface water quality throughout Region 5. Mining, logging, agricultural, industrial, and urban development activities have reduced water quality significantly at specific sites and generally across the entire area. The Montana Department of Health and Environmental Sciences has inventoried surface waters throughout the state and identified "impaired streams". This information includes each streams' principal use, causes for the impairment and potential source of impairment. Table 2 lists impaired streams located near FWP sites.

Although most community drinking water systems in Region 5 use groundwater sources, several communities obtain portions of their drinking water from surface supplies including:

Municipal Water Supply[1]	Surface Water Source
Big Timber	Boulder River
Billings	Yellowstone River
Columbus	Yellowstone River
Hardin	Bighorn River
Laurel	Yellowstone River
Lockwood	Yellowstone River

[1] Johnson et al. 1988

3.42 GROUNDWATER

Groundwater is the principal source of drinking water for most residents of south-central Montana. It is often the only source of water for residences and communities that lack a central water supply system. Even in cities with a municipal surface water system, some residents and businesses use groundwater.

The principal drinking water aquifers are relatively shallow and composed of alluvial sediments in both wide valleys and narrow canyons. These alluvial aquifers are typically unconfined systems with groundwater depths varying from at the ground surface to more than 100 feet. Although the specific geology may vary, these aquifers are commonly composed of very coarse geologic material. Recharge to valley-bottom aquifers comes principally as leakage from streams. Recharge from flood irrigation and leakage from irrigation ditches is locally an important input to groundwater. Other minor recharge sources include local precipitation and discharge from underground septic systems.

Although general water quality varies considerably throughout Region 5, most groundwater is very high quality. Water quality problems sufficient to cause well closures have mainly occurred around urban areas. Chemical contamination has included petroleum products, volatile organic chemicals, pesticides, septic wastes (nitrates, phosphates, bacteria), and other manufactured compounds.

TABLE 2. IMPAIRED WATER BODIES AT FWP REGION 5 SITES[1]

STREAM/LAKE	PRINCIPAL USE	IMPAIRMENT CAUSES	CONTAMINATION SOURCES
Big Horn River	aquatic life support, coldwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	other inorganics, pH, organic enrichment/DO, salinity/chlorides/ TDS, thermal modifications, flow alterations, suspended solids	agriculture, flow regulation/modification, natural
Boulder River	fully supports all uses without impairment	None	None
Clark Fork River	aquatic life support, coldwater fishery, warmwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	metals, nutrients, pH, siltation, salinity/chlorides/ TDS, thermal modifications, flow alterations, suspended solids	irrigated crop production, range land, surface mining, petroleum activities, streambank modifications/destabilization
Musselshell River	aquatic life support, coldwater fishery, warmwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	other inorganics, siltation, salinity/ chlorides/TDS, thermal modifications, flow alterations, other habitat alterations	irrigated crop production, range land, highway/road/ bridge, streambank modifications/destabilization
Stillwater River	aquatic life support, coldwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	metals, flow alterations, habitat alterations	mining, irrigated crop production, highway/ road/bridge, land development
Yellowstone River	aquatic life support, coldwater fishery, warmwater fishery, recreation, drinking water supply, agriculture, industrial use	metals, nutrients, habitat alterations, suspended solids	municipal sources, industrial, irrigated crop production, highway/road/bridge, streambank modification, petroleum activities, natural
Bluewater Creek	aquatic life support, coldwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	siltation, thermal modification, flow alterations, other habitat alterations, suspended solids	irrigated crop production, range land, flow regulation/ modification

[1] Montana Department of Health and Environmental Sciences, 1990

TABLE 2. IMPAIRED WATER BODIES AT FWP REGION 5 SITES[1]

STREAM/LAKE	PRINCIPAL USE	IMPAIRMENT CAUSES	CONTAMINATION SOURCES
Pryor Creek	aquatic life support, coldwater fishery, warmwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	metals, other inorganics, flow alteration, suspended solids	irrigated crop production, natural
Rock Creek	aquatic life support, coldwater fishery, warmwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	nutrients,siltation, habitat alterations, flow alterations, suspended solids	municipal point sources, irrigated crop production range land, highway/road/ bridge
Cooney Reservoir	aquatic life support, coldwater fishery, warmwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	siltation, flow alterations, noxious aquatic plants	irrigated crop production, range land, natural
Deadman's Basin Reservoir	aquatic life support, coldwater fishery, recreation, swimming, drinking water supply, agriculture, industrial use	flow alteration, other habitat alteration	irrigated crop production, natural

[1] Montana Department of Health and Environmental Sciences, 1990

Most streams and lakes in Region 5 are classified as "B-1" or "B-2" which means the water is:

"B-1" "...suitable for drinking, culinary and food processing purposes, after conventional treatment; bathing, swimming and recreation: growth and propagation of salmonid fishes and associated aquatic life, waterfowl and fur bearers; and agricultural and industrial water supply" (ARM, Title 16, Chapter 20).

"B-2" "...suitable for bathing, swimming and recreation: growth and marginal propagation of salmonid fishes and associated aquatic life, waterfowl and fur bearers; and agricultural and industrial water supply" (ARM, Title 16, Chapter 20).

The Musselshell River Drainage below Deadman's Basin diversion canal above Shawmut, and the Yellowstone River Drainage from the Billings water supply intake to the North Dakota state line and including portions of the Big Horn River are classified as "C-3" which means the waters are:

"...suitable for bathing, swimming and recreation, growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and fur bearers. The quality of these waters is naturally marginal for drinking, culinary and food processing purposes, agriculture and industrial water supply. Degradation which will impact established beneficial uses will not be allowed" (ARM, Title 16, Chapter 20).

3.5 Vegetation

Vegetation in Region 5 varies from landscaped urban areas and agricultural crops, to riparian zones, grasslands, shrublands, conifer forests and alpine tundra. Although agriculture and urban development have altered natural vegetation throughout Region 5, much of the landscape is still dominated by native plants. The areas where vegetation has been most altered by man's activities are valley bottoms, especially near surface water. These are also the typical locations for most FWP sites.

Vegetation on FWP sites in Region 5 is highly variable but is dominated by riparian, grassland/shrubland and dry forest types.

Riparian vegetation reflects the extra water available near lakes and streams and where water tables are within plant rooting depths. These habitats are extremely diverse and abundant with large numbers of different plant and animal species. Riparian habitats in Region 5 often have tree canopies of black cottonwood, aspen, ponderosa pine, and Rocky Mountain juniper. Riparian shrubs include many willow species as well as red-osier dogwood, hawthorne, alder and others. Sedges, rushes, ferns and other moist site species are also common.

Grassland/shrubland vegetation is common at the lower elevations just uphill from riparian areas. Soils are often droughty (sandy with little moisture and nutrient holding capacity). Shrubs often are most common where surface soils are rocky. Grasses often dominate soils with surfaces low in rock content. Native shrubs on these sites include woodrose, serviceberry, chokecherry, rabbitbrush, woodrose and ninebark. Common native grasses include Idaho fescue, rough fescues, bluebunch wheatgrass, bluegrasses, and pinegrass.

Cottonwood trees grow by the river bottoms along with Ponderosa pine. Ponderosa pine is the most common conifer tree species at sites on FWP lands in Region 5.

Agricultural croplands cover significant areas of valley bottoms in Region 5. Alfalfa and grass hay are the dominant crops, which also include small grains, and a few specialty crops.

Noxious weeds and other non-native species have replaced native species in disturbed areas of all local state parks and fishing access sites. These plants reduce biodiversity, reduce available wildlife forage, reduce aesthetic quality and impact resources in many other ways. Weeds also have a tremendous economic impact on agricultural crops and on managed turf areas. Weed control is necessary on adjacent lands to reduce weed control needs and costs on these areas.

Some plant species found in western Montana are rare and endangered and may be protected under the Federal Endangered Species Act of 1973 (50 CFR Part 402). There is no existing record of designated rare or endangered species at state parks, fishing access sites, wildlife management areas or FWP regional headquarters in Region 5. There is one recorded endangered species (Eupatorium Maculatum Var Bruneri) located at the Bluewater Fish Hatchery in Region 5. There has been a partial comprehensive inventory of plant species on individual parks, fishing access sites, wildlife management

areas and state fish hatcheries. A more complete inventory will take place as part of site-specific evaluations and prescriptions.

With the exception of Eupatorium Maculatum Var Bruneri at the Bluewater Fish Hatchery, no other rare or endangered plants have been located at these sites. However, a number of plants listed as "sensitive" have been reported. These plants are considered to have potential for future listing as rare or endangered. In addition to individual plant species, certain plant communities or associations are also listed as sensitive. Table 3 illustrates reported occurrences of sensitive plant species and associations at or near FWP sites in Region 5 (Montana Natural Heritage Program 1993).

TABLE 3. SENSITIVE PLANT OCCURRENCES ON DEPARTMENT FWP ACCESS SITES.

All sensitive plants listed have been found within one mile of the listed access site. All sites will be monitored for sensitive plants throughout the region where weed control is in effect. This information was obtained from the Montana Natural Heritage Program.

River	Site	Species or Association
Stillwater	Buffalo Jump	Small Yellow Lady's Slipper (*Cypripedium Calceolus Var Parviflorum*)
Bluewater (Carbon County)	Bluewater	Rabbit Buckwheat (*Erigolum Lagopus*) Parrot-Head Indian Paintbrush *(Castelleja Longispica)* Giant Helleborine (*Epipactis Gigantea*) Joe-Pye Weed (*Eupatorium Maculatum Var Bruneri)*
(Wheatland County)	Haymaker G.R.	Northern Rattlesnake Plantian (*Goodyera Repens)*

3.6 Wildlife and Wildlife Habitat

FWP lands in south central Montana provide homes and temporary habitat for a tremendous diversity of wildlife. Many of these sites are dominated by riparian areas which are particularly rich in plant and animal life.

Large animals include elk, mule deer, white-tailed deer and antelope. Less common are black bear and moose. Common predators include mountain lion, bobcat, red fox, coyote, and badger. Raptors include bald and golden eagles, red-tailed hawk, osprey, prairie falcon, turkey vulture, kestrel and several species of owls. Small mammals make up a substantial prey base for these birds such as ground squirrels,

voles, gophers, mice, and rabbits. Other small mammals in Region 5 include beaver, muskrat, otter, mink, skunk, porcupine, weasel, and raccoon, among others.

Numerous upland bird species, waterfowl and shorebirds flourish on FWP sites in Region 5. The most common include ring-necked pheasants, sharp-tail and ruffed grouse as well as hungarian partridge. Sandhill cranes, white pelicans and blue heron are common in wetlands and near open water. Canada geese, tundra swan, and mallard, pintail, gadwall, teal, widgeon, merganser, wood ducks and golden-eye ducks and many others are also found in Region 5. A wide variety of shore birds can be seen at Big Lake WMA. Upland plover, American avocet, black necked stilt, greater yellowlegs and sandpipers are just a few of the many species.

Federally listed endangered species in Region 5 include the peregrine falcon, and bald eagle.

Natural habitats with good quality water and suitable vegetation are essential to survival and reproduction of wildlife. Most valley bottom wildlife habitats in Region 5, especially along the streams, have been dramatically altered by agriculture or urban development. Where soils have been disturbed, and not replanted, weeds have replaced the native plants. Most of these alterations have resulted in less food, shelter and security.

3.7 Fisheries

Rivers and lakes within Region 5 support a variety of game and non-game fish including coldwater species such as trout and whitefish, and warmwater species such as bass, walleye, and catfish. Many local streams and their fish populations have been dramatically impacted by mining, silviculture, agriculture, and other human activities. Watershed management to improve water quality and quantity is needed for many waters to reach their potential carrying capacities.

Yellowstone cutthroat trout is listed by the American Fisheries Society as a "Species of Special Concern". This designation means that the cutthroat has limited numbers and/or habitat in Montana and throughout North America. The elimination of this species in Montana could have a significant effect on the gene pool of the subspecies.

All fish species mentioned above are likely to occur at fishing access sites and state parks in Region 5. Individual species are distributed according to habitat needs and conditions.

4.0 ENVIRONMENTAL CONSEQUENCES

This section compares the environmental consequences of each alternative weed management approach presented in Section 2. Specific consequences are evaluated for each of the affected environment components described in section 3.

4.1 Air Quality

Air quality would not be significantly affected by any of the alternatives. Under Alternative 2 (Chemical Control), and Alternative 4 (IPM), herbicides would be used which could result in a minor, localized, temporary impact on air quality. Alternative 4 would use significantly less herbicides. These impacts would be the chemical odor and potential health risks especially for sensitive individuals but should only occur for a very short time. Impacts on air quality are minimized by not applying during windy conditions. Equipment must be functioning properly and operators must be trained in proper use and emergency response.

4.2 Soils

Soils may be significantly affected under all alternatives. Negative soil impacts include increased erosion and sedimentation, reduced site productivity and increased herbicide contamination. Soils may also be negatively impacted by the buildup of weed seeds.

Alternative 1 (No Action) would result in further weed spread. Although weeds quickly invade disturbed soil providing some immediate erosion control, weedy areas generally have more bare soil and higher erosion rates than undisturbed, native plant communities. Soil contamination by weed seeds and rhizomes would occur under this alternative providing a reservoir for continuing weed problems. As weeds spread, some release allelopathic chemicals into the soil which build up to levels that impede the germination and growth of other plants and give weeds a competitive advantage. Soil contamination by herbicides is possible from current limited herbicide use due to overapplication, misapplication or accidental spills.

Alternative 2 (Chemical Control) presents the greatest risk of soil contamination due to the amount and frequency of herbicide use. The potential for over-application, misapplication and accidental spills increases with increased use. Application equipment would probably be larger in this alternative and the potential exists for larger spills. Short term soil erosion may occur when weeds are eliminated before other plants occupy the available space. Soil contamination with weed seeds and allelopathic compounds would be reduced under this alternative due to weed control.

Alternative 3 (Non-Chemical Control) would eliminate the potential for herbicide impacts to soils, however, as discussed above, some mechanical treatments may cause short-term erosion. Soil contamination with weed seeds and allelopathic compounds would be reduced under this alternative if weeds are adequately controlled.

Alternative 4 (Integrated Pest Management) has a higher risk of contamination due to herbicide over-application than Alternative 3 but less or similar risks as the other alternatives since they also include herbicides. Chemical use may be significant initially but should decrease dramatically over time with this method thereby reducing the potential for contamination. Soil contamination with weed seeds and allelopathic compounds would be reduced under this alternative if weeds are adequately controlled.

4.3 Water Quality

Alternative 1 (No Action), **Alternative 2** (Chemical Control) and **Alternative 4** (IPM) have the greatest potential for groundwater and surface water contamination since they include herbicide use. **Alternative 2** has the greatest potential for impacts since more frequent chemical applications would be made across larger areas. **Alternative 4** has the least potential for chemical contamination of these three alternatives since herbicide applications would be most closely monitored.

No adverse impacts to surface and groundwater are expected under any of these alternatives if label instructions are followed and there are no accidental spills.

The greatest risk of water quality impacts is from accidental spills. This risk can be reduced by mixing smaller loads of chemicals, increasing care in applications and by using the least toxic and persistent herbicides available. The chemicals proposed for use in FWP Region 5 are among the least persistent, least mobile and least toxic available. Risks can also be reduced by establishing and maintaining an effective emergency spill containment plan. An emergency response plan has been proposed for herbicide applications in FWP Region 5. In most cases, accidental spills should only impact water quality in a small area due to the dilution factor in most streams or aquifers. Cultural, mechanical, and biological control should be used in areas where water quality is a special concern.

Herbicide movement in runoff from treated areas is possible but unlikely. Label instructions require that no chemical be applied in a manner that it may be carried into water bodies. Weeds should be controlled by other methods in areas with potential for this type of runoff contamination.

Under some conditions, herbicides may leach through soils and contaminate groundwater. This is most common when herbicides are not applied properly. Excessive application may occur from improper mixing, over spraying, multiple application and other reasons. Many factors influence the potential for herbicide movement. These factors include herbicide behavior in soil (i.e. persistence, mobility, absorption, water solubility and microbial degradation), soil properties (texture, permeability, organic matter content, thickness), and depth to groundwater. Factors which may increase the likelihood of herbicide contamination include rapidly permeable soils (sandy and gravely), low organic matter content soils, persistent herbicides, highly soluble herbicides, shallow groundwater, and high precipitation.

Movement of picloram (Tordon) has been reported in soils (National Research Council of Canada 1977). Sandy soils and those which have bedrock within 20 inches have the greatest potential for movement. Sandy soils may be too porous and not have the moisture holding capacity to prevent rapid deep percolation of herbicides. In shallow bedrock areas, herbicide laden water could potentially leach to bedrock, migrate along the bedrock surface, and arise downslope in off-target areas. Bedrock fissures could act as conduits to groundwater movement.

The half-life of an herbicide is the time required for half the amount of herbicide introduced into a living system to be eliminated or degraded by natural process. Half-life can be affected by the application rate. According to USDA Pesticides Background Statements (1984), picloram can have a half-life of more than four years in arid regions and approximately one month under favorable soil conditions (moist soils, high organic matter content). This relatively long persistence in soil and poor affinity to soil (Watson et al. 1989), could result in leaching of picloram is applied to recharge or shallow groundwater areas (within 10 feet of the surface) and/or highly permeable soils. Studies of various soil types indicate that picloram is usually confined to the upper 1 foot (30 cm) when application rates are low (less than 1 lb/acre) (USDA Forest Service 1984). However, at rates of 3 to 9 lb/acre, picloram can readily move to depths greater than 3 feet (approximately 1 meter), even in relatively arid regions. Pichloram use is precluded on flood-irrigated or sub-irrigated lands.

Glyphosate strongly adsorbs to soil particles and is easily broken down by microbial decomposition. Therefore glyphosate does not generally threaten groundwater quality (USDA Forest Service 1984). The environmental fate of other chemicals proposed for use in FWP Region 5 has not been researched as extensively as those discussed above. However, these other herbicides proposed for use in Region 5 have relatively low persistence and solubility suggesting that their risk of impacting water quality is low.

Techniques for reducing the potential for water quality impacts from herbicide use include:

- Proper mixing and application according to label instructions.
- Matching herbicides to specific soil and site conditions.
- Identification of water quality protection zones and runoff areas.
- Use of less persistent, mobile and toxic herbicides.
- Implementation of an emergency spill response program.
- Use of hand guns, squirt bottles or other small equipment.
- Use of alternative controls in sensitive areas.
- No application during windy conditions.

4.4 Vegetation

Alternative 1 (No action), would allow weeds to continue increasing and allow new species to invade park and fishing access sites. Weeds could also spread from FWP lands to adjacent properties. Native plant species abundance and diversity would decrease as weeds occupy space formerly used by native plants. Wildlife, insect and other life dependent on the native plant species would be directly impacted.

Weed species compete very effectively for nutrients and space and so are often pioneer species on disturbed sites. Some species, including knapweed and leafy spurge produce toxins that inhibit growth (Kelsey and Bedunah 1989, Harvey and Nowierski 1989). These factors result in the decline of native species and desirable non-native species. Some weed species grow as near mono-cultures and disrupt the ecological integrity of native plant communities. Animal and insect populations adapted to life in a particular community may not be able to survive under new conditions. Man has had such a dramatic influence on vegetation to date that further invasion of exotic species is merely a continuation of community disruption that has already occurred.

Alternative 1 would continue to permit the substantial economic impact of weeds. Knapweed alone is estimated to cost the Montana range livestock industry as much as $4.5 million annually in lost forage (French and Lacey 1983). Under the "no control" option, FWP lands would continue to contribute to these losses which would increase until weeds are established across their entire potential range. Forage losses to livestock also mean losses to wildlife, especially big game. Forage production loss predictions (for spotted knapweed) are high in susceptible plant communities.

Some noxious weeds may have limited beneficial uses as ornamental plants (purple loosestrife, dalmatian toadflax), as food for bees (spotted knapweed) or other uses. As pioneer plants weeds have served an important function for soil stabilization and erosion control. Many sites in south-central Montana would have little protection from erosion without weeds, especially knapweed. These beneficial uses would be preserved under Alternative 1.

Alternative 2 (Chemical Control), would encourage native plant species to flourish by removing competition from weeds. Species diversity and abundance should increase as weeds are replaced with native species. Sensitive plant species may be preserved if they are not susceptible to the specific chemicals applied. Herbicides proposed for use in Region 5 are mostly very selective for specific weeds and may not impact most other plants. Recent studies suggest that chemical weed control using clopyralid and picloram may be possible without adverse impacts to desirable vegetation (Land and Water 1992). Specific impacts would depend on the application rate, method, carrier, and herbicide specificity for target plants. Procedures have been developed to minimize or eliminate potential adverse effects from herbicides on desirable vegetation. Special attention is needed in riparian and wetland areas and at sites with threatened, endangered and sensitive plant species. If these procedures are followed, impacts should be low.

Broad spectrum application methods (vehicle-mounted boom application) would likely be used more frequently under this alternative. This larger-scale application makes spot treatment difficult and may result in greater damage to non-target vegetation.

Alternative 3 (Non-chemical Control), would provide weed control of moderate effectiveness and native species would be somewhat reduced in abundance and diversity as weeds continue to invade and grow. Most of these methods, including mowing, weed whipping and hand pulling do not provide complete control effectiveness but only reduce growth or seed production. Mowing before native grasses mature could have serious negative impacts on vigor and distribution of native grasses. Mechanical weed control may impact non-target and sensitive plant species if workers are not trained adequately in plant identification. Using grazing animals for weed control continues to be the subject of debate. In many cases, animals have not been sufficiently selective to control weeds without also impacting desired plants.

Alternative 4 (Integrated Pest Management), would have impacts similar to those described for Alternative 2 (Chemical Control) but these impacts should be greatly reduced due to the smaller quantity of herbicide applied over the long term. Alternative 4 allows for the greatest flexibility in approach and use of optimum treatment methods for a give situation. The potential impacts are expected to be low. There is potential for negative impacts to non target plants including sensitive species. These impacts would result from improperly trained personnel removing desired plants or over-applying herbicide to these plants.

4.5 Wildlife and Wildlife Habitat

Alternative 1 (No Action) would allow further weed invasion and spread which would reduce native forage and cover and their associated wildlife values. Wildlife abundance and diversity would decrease over time as habitat quality is degraded by further weed encroachment. French and Lacey (1983) showed in a study of knapweed that forage production (primarily grass species) dropped from 891 to 54 pounds per acre.

Wildlife species that benefit from local weed species would benefit from this alternative since weeds are expected to increase.

The potential impacts of chemicals on wildlife are discussed under Alternative 2.

Alternative 2 (Chemical Control) would reduce weed impacts on native plants and promote more abundant and diverse vegetation communities. This increased vegetative diversity and abundance should encourage a similar response in most wildlife species. However, this alternative would increase the chance of wildlife exposure to chemicals and the potential for acute or chronic impacts.

Species which gain food or shelter from weeds may be negatively impacted by this alternative but probably will adapt to alternative foods and habitat. These species include birds that eat weed seeds and those that seek cover in heavy infestations.

The potential for wildlife to suffer acute toxic reactions to weeds will be reduced under this alternative since weeds will be reduced. The potential for weeds having acute toxic effects on wildlife has not been well investigated although significant effects have been reported with livestock.

There is the potential under this alternative for wildlife to become exposed to chemical herbicides by ingestion of treated plants or by dermal absorption. It is likely that any exposure would be very small and of short duration. Only where animals have been directly sprayed or fed exclusively on sprayed vegetation have toxic doses been documented (USDI-BLM 1985). Exposure of dogs to meat from an animal that had eaten heavily on sprayed vegetation resulted in a dosage of less than 1/400 of the LD_{50} (USDA-FS 1989). Table 4 illustrates that pesticides are probably not a serious threat to most wildlife species when considering the LD_{50}.

It is unlikely that wildlife can receive lethal or even large doses of properly applied pesticides except at spill sites. This emphasizes the importance of immediate and effective spill response. If wildlife does ingest a significant amount of pesticide, it is likely that it would be excreted quite rapidly with little effect.

Table 4. Lethal dosages (LD_{50}) for selected animals (mg/Kg)[1]

Species	Picloram	2,4-D	Glyphosate
mouse	2,000-4,000	368	na[2]
(rat)	8,200	375	4,320
dog	na	100	na
cat	na	820	na
chicken	6,000	541	15,000 no effect
(mallard)	_2,000	na	_2,000
pigeon	na	668	na
rabbit	2,000	424	3,800
cow	540	100	na
(mule deer)	na	400-800	na

1. The data in this table were taken from USDA-FS 1989, Sassman and others 1984 and USDA-FS 1988.
2. na = data not available.

Little information is available on wildlife impacts from treatment in areas used for calving, fawning, nesting, or rearing of young. It is possible that young or unborn animals could be negatively affected through direct contact, ingestion or parent contact.

Bio-accumulation of contaminants in the food chain was of critical importance with the now-banned insecticide DDT, particularly for sensitive species such as raptors. Herbicides proposed for use by FWP are known to be rapidly metabolized and excreted by mammals. Glyphosate and picloram do not bio-accumulate in fish and animals (US EPA 1983, 1986, 1988; USDA Forest Service 1984). No evidence was found in the literature to support adverse bio-accumulation problems from herbicides proposed for use by FWP.

Alternative 3 (Non-Chemical Control) is unlikely to provide effective weed control across all FWP lands since efforts would be severely limited by budget constraints. Weeds would therefore continue to occupy significant areas and may increase at some sites. Weeds reducing forage and cover values also may affect wildlife due to changes in the timing of available forage.

Alternative 4 (Integrated Pest Management) utilizes an approach integrating cultural, mechanical, biological, and chemical control methods. By using an integrated approach to weed management, areas critical to wildlife species during specific seasons could be treated at times or by techniques that would have the fewest negative impacts. Substitution of mechanical or other methods in critical wildlife areas could minimize impacts. Because this approach may use limited amounts of herbicides, there are similar concerns to those discussed in Alternative 2. These concerns are somewhat reduced by the smaller quantities used in this approach.

Under this alternative, wildlife would benefit from the many advantages of effective weed control as discussed above including less weeds and more native forage.

4.6 Fisheries

Alternatives 1, 2 and 4 have small potentials to adversely impact fisheries. These potential impacts are mainly related to accidental spills and gross misapplications. Alternative 2 (Chemical Control) has the greatest potential to affect fisheries since it would require the most chemical applications.

Accidental spills will be minimized by using properly trained personnel and maintaining procedures and equipment for emergency spill response. Chemical contamination from application will be prevented by following label instructions. These instructions require that applications not be made in such a manner that the chemical may enter surface waters.

Acute impacts on fisheries could occur if in-stream concentrations of herbicides exceed levels that are toxic to resident fish. This is extremely unlikely under these management alternatives due to the small quantities available to be spilled and the tremendous dilution potential of most surface water bodies. Chronic and food-chain impacts could occur if in-stream levels become sufficiently elevated for long enough to allow accumulation. This is also unlikely due to the short duration of applications.

Herbicide toxicity to fish and aquatic life varies depending upon the chemical, the fish species and the environmental factors. Chemical herbicides will not be used in riparian areas or near water bodies.

Alternative 3 will not use chemical herbicides and no adverse effects on fisheries are expected.

4.7 Human Health

Alternatives 1, 2 and 4 have small potentials for adverse health effects due to the use of chemical herbicides. A comprehensive review of potential health effects from herbicides is beyond the scope of this environmental assessment. Detailed discussions on this subject can be found in many other sources (Monnig 1988, USDI 1985 & 1987, USDA 1989).

In these alternatives, human health risks will be minimized by using the least toxic, persistent and mobile herbicides available. The responsibility for exposure and risks will be shared by individuals at FWP sites through a signing program. Visitors will have the choice of exposure during and following application periods. All applications will be made by trained personnel with proper protective equipment.

Health problems related to chemicals include allergic reactions, acute toxic effects and chronic exposure impacts. A small percentage of the population is highly sensitive or allergic to many chemicals, including herbicides. Exposure for these individuals can mean incapacitation or death. A good public awareness campaign including signs should reduce risk for these persons.

Unlike DDT, picloram and glyphosate do not bio-accumulate. These herbicides are water soluble and are excreted rapidly. Application workers are at the highest risk for exposure.

Additional precautions would be implemented when herbicides are applied to high intensity human use zones in campgrounds and parks. Picloram, which is persistent, will not be used in these areas.

Inert ingredients in herbicide formulations which include surfactant, emulsifiers, and other additives have lately come under scrutiny for toxicological and carcinogenic effects. As of 1990, the EPA had listed approximately 115 inert substances which require further regulation or testing.

Alternatives 1, 3, and 4 include mechanical control methods which pose risk to workers from lifting, pulling, walking over rough terrain, and operating equipment. These risks should be kept to a minimum if OSHA work practices and standards are followed. Use of biological control methods should not affect human health.

4.8 Environmental Review Criteria

Future noxious weed management activities proposed under the Region 5 Weed Management Plan shall be reviewed in accordance with the following Environmental Review Criteria. In some cases, proposed activities may be determined by the Department of Fish, Wildlife and Parks to be categorically excluded from further environmental review. Those weed management activities for which the answer to every question below is "yes" are categorically excluded from subsequent review and can proceed under the current documentation. Activities triggering a "no" response to any of the questions below would prompt one of the following:

1) modification of the proposed activity to return it within the scope of the environmental analysis contained in this document

2) rejection of the proposed activity outright

3) initiation of a separate environmental review process for the proposed activity.

DESCRIPTION OF THE PROPOSED ACTIVITY:

ENVIRONMENTAL REVIEW CRITERIA	YES	NO
will the weed management activity be conducted by using principles of good judgement?		
will the application of non-aquatic-labelled herbicides to running or standing water be avoided?		
will surface waters be buffered from the introduction of excessive amounts of sediment as a result of weed treatment activities?		
will herbicides be mixed and loaded at least 500 feet away from open water?		
will wick applicators be used when applying non-aquatic-labelled herbicides within 50 feet of surface waters?		
will aquatic-labelled herbicides be selected for areas with a sandy or gravelly soil consistency and for areas with water tables within 3 feet?		
will herbicide applications be avoided within 50 feet of high human use areas?		
will herbicide treatment sites be posted prior to and for 24 hours after herbicide application to notify the public that spraying activities will/have occurred?		
will the use of mechanized power equipment (e.g. mowers) be postponed when treatment sites are occupied by the public?		
will herbicide manufacturer label instructions be followed at all times?		

ENVIRONMENTAL REVIEW CRITERIA	YES	NO
will herbicides be applied by licenses applicators?		
will aerial herbicide applications be avoided?		
will herbicide applications be suspended when rainfall is expected within 24 hours, air temperatures exceed 85° F, or wind speed exceeds 8 m.p.h.?		
will herbicide spray equipment deliver a median drop diameter between 200 microns and 800 microns?		
is an Herbicide Emergency Response Plan in place?		
are biological control agents approved for release by the Animal and Plant Health Inspection Service?		
will riparian vegetation and surface water banks be protected from excessive disturbance resulting from weed management activity?		
will adverse impacts to rare, unique, threatened or endangered species resulting from weed treatment activities be avoided?		
will wildlife habitat be protected from excessive deterioration or disturbance during weed treatment activities?		
will Department personnel consider the impact of a weed treatment activity on wildlife populations, diversity, and distribution?		
will cultural/historic resources be protected from physical damage during weed treatment activities?		

ADDITIONAL COMMENTS:

5.0 PUBLIC INVOLVEMENT

The Montana Fish, Wildlife and Parks Region 5 Office has prepared a Draft Environmental Assessment (EA) for managing noxious weeds on state-owned Parks and Fishing Access Sites, and other lands. Public involvement will be a key element in developing a plan for managing noxious weeds that best meets the concerns of the public. The Plan and EA will be subject to public review during a thirty day comment period. All concerns and comments will be written and submitted to the Region 5 FWP office. A public hearing will be held if there is significant written comment and a public meeting is determined necessary. All comments will be addressed in the EA document and may be used to amend the plan or be included as addendums to the plan or revised plan.

6.0 SUMMARY

This draft environmental assessment allows for comparison of weed management options in FWP Region 5. In combination with agency and public review, this information will be used to select and refine a final weed management alternative for implementation. The final choice of a weed management plan will be announced in a Decision Memo issued by the director of FWP Region 5. This ROD should be completed by May 1994.

7.0 REFERENCES

Hansen, P., S. Chaddee and R. Pfister. 1988. **Riparian Dominance Types of Montana.** Montana For. And Range Cons. Exper. Sta. U. Montana, Missoula, MT. 411p.

Land and Water Consulting. 1993. **Draft Weed Management Plan:** Montana Department of Fish, Wildlife and Parks, Missoula, MT. 33p. (processed).

Land and Water Consulting. 1991. **Weed Control Monitoring Plots**, Glacier National Park, Montana. 38p.

Land and Water Consulting Inc. 1992. **Pest Management Plan: The University of Montana**. Land and Water Consulting, Missoula, MT. 65p.

Montana Cooperative Extension Service. 1992. **Montana Weed Control Guide.** EB. 23.

Montana Heritage Program. 1993. Personal communication - **Threatened, Endangered and Sensitive Species Search** for FWP Region 5, Helena, MT.

Montana Water Quality Bureau. 1990. **Montana Water Quality, 1990.** Water Quality Bureau, Department of Health and Environmental Sciences, Helena, Montana.

Story, J. 1979. **Biological Weed Control in Montana.** Montana Ag. Exp. Sta. Bull. 717. Montana State University, Bozeman, MT. 15p.

USDA Animal and Plant Health Service. 1989. **Biological Control of Leafy Spurge.** Program Aid 1435. 11p.

USDA Forest Service. 1986. **Draft Environmental Impact Statement: Custer National Forest Noxious Weed Treatment Program**, Billings, MT.

USDA Forest Service. 1989. **Draft Environmental Impact Statement: Noxious Weed Management Plan,** Missoula, MT.

USDA Soil Conservation Service (SCS). 1981. **Average Annual Precipitation, Montana.**

USDI, Bureau of Land Management (BLM). 1985. **Environmental Impact Statement of Northwest Area Noxious Weed Control Program**, Portland, OR.

USDI, Bureau of Land Management (BLM). 1989. **EIS Vegetation Treatment of BLM Lands in Thirteen Western States**, Casper, WY.